SYRCL SOUTH YUBA RIVER CITIZENS LEAGUE

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September 30, 2008

Kenneth D. Landau, Assistant Executive Officer
California Regional Water Quality Control Board, Central Valley Region
11020 Sun Center Drive, Suite 100
Rancho Cordova, CA 95670-6144

Dear Mr. Landau,

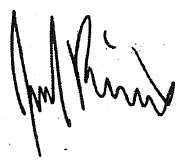
The enclosed report has been prepared by SYRCL's River Science Director Gary Reedy, and documents many failures of the Donner Summit Public Utilities District (DSPUD) to meet waste discharge requirements issued by the Regional Water Board (RWB) in 2002. In addition to the violations documented by the RWB in April 2007, effluent has exceeded limits for Turbidity, Suspended Solids, Chlorine and Coliform Organisms. Some of these violations have likely had significant impacts on aquatic life in the South Yuba River, and pose a risk to human health. Despite a 5-year period to comply with nitrate and ammonia requirements, the level of nitrates in DSPUD's effluent has not improved. The report also discusses other potential violations -- such as discharge when land disposal is possible -- that are significant from the standpoint of protecting water quality in the South Yuba River.

The report provides evidence to support scrutiny of the performance of the wastewater treatment plant and of DSPUD's efforts to obtain a permit for expanded operations. In contrast to DSPUD's Report of Waste Discharge, Mr. Reedy's analysis of dilution potential indicates that DSPUD is willing to discharge to the South Yuba River in volumes and at times that would yield a river composed of almost one-half effluent.

We request confirmation by the RWB as to the potential violations presented in the report. Moreover, we encourage the RWB to carefully consider all potential violations and the other comments in this report when preparing a new draft permit for DSPUD.

We look forward to future opportunities to participate in this critically important process.

Sincerely,



Jason Rainey
Executive Director

Wastewater in the South Yuba River: DSPUD's Non-Compliance with Discharge Requirements and Other Comments on the Discharger Permit Summary

September 30, 2008

Submitted to:
Central Valley Region Water Quality Control Board
11020 Sun Center Drive, Suite 100
Rancho Cordova, CA 95670-6144

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Introduction and Background

The Donner Summit Public Utility District (DSPUD) operates a Waste Water Treatment Plant (WWTP) that discharges effluent to the South Yuba River beginning in the fall of each year and continuing as late as July 31. The South Yuba River at the discharge point is an ephemeral stream. During the dry season, DSPUD disposes of wastewater by irrigation of land associated with Soda Springs Ski Area.

Discharge of effluent to the river has averaged approximately 0.24 Mgal/d over recent years. Maximum daily discharge typically occurs during winter holidays and has so far peaked at 0.92 Mgal. The WWTP is permitted for an average monthly discharge of 0.52 Million gallons per day (Mgal/d) and has a total storage capacity of 1.5 million gallons.

The WWTP is permitted to operate under a set of requirements issued by the Regional Water Quality Control Board (RWQCB) in 2002. The requirements of WDR-55-2002-088 (heretofore noted as WDR-2002), are not only specific to certain constituents of effluent and receiving water, but also require DSPUD to follow certain schedules of monitoring and reporting.

WDR-2002 was accompanied by a Cease and Desist Order (WDR-55-2002-089) which recognized the inability of the WWTP operations at that time to meet required limits for nitrate and ammonia, and provided DSPUD up to five years to come into compliance for those pollutants. The requirements of WDR-2002 for nitrate and ammonia have been in full effect since April 1, 2007.

DSPUD provided RWQCB with a Report of Waste Discharge (ROWD) in April 2007 which requests a new permit with less stringent requirements for many of the constituents addressed in WDR-2002, including much higher limits for nitrate and ammonia. The RWQCB responded on September 15, 2008 with a Discharger Permit Summary that includes proposed effluent limitations which generally accommodate DSPUD's request.

The purpose of this report is to provide the RWQCB and interested parties with 1) documentation of DSPUD's record of non-compliance with WDR-2002, and 2) a formal response to both the ROWD and Discharge Permit Summary. SYRCL will be providing additional comments to the RWQCB concerning a new permit for DSPUD at future steps in the process. SYRCL acknowledges the diligent work of RWQCB staff for public service under challenging conditions of permit backlog and understaffed enforcement personnel. We intend this submission and future contributions to be helpful to the public service goals of the RWQCB.

The Record of Non-Compliance

This section documents incidence in which DSPUD appears to violate requirements of WDR-2002. At the time of this report, I have neither the entire record of data and documents on file at the RWQCB, nor the responses from RWQCB staff to findings and assertions in this report. My reference to apparent and potential violations may be considered conditional upon the confirmation of RWQCB staff. Due to stated limits in available data and documentation, these results are not a comprehensive record of non-

compliance. A secondary objective of this report is to provide possible assistance to the RWQCB in providing a comprehensive record of non-compliance before issuing DSPUD with a new permit for wastewater discharge.

Table 1 contains some of the effluent limitations required in WDR-2002. Additional requirements can be found in the document and are referenced in subsections below.

Table 1: Some effluent limitations as presented in WDR-2002.

Constituents	Units	Monthly Average	Weekly Average	7-day Median [6]	Daily Maximum	1-hour Average
Ammonia [5]	mg/l	C	---	---	---	D
BOD [1]	mg/l	10 [2]	15 [2]	---	30 [2]	---
	lbs/day [3]	43	65	---	130	---
Chlorine Residual	mg/l	---	0.01	---	---	0.02
	lbs/day [3]	---	0.043	---	---	0.086
Nitrate (N)	mg/l	10	---	---	---	---
	lbs/day [3]	43	---	---	---	---
Settleable Solids	ml/l	0.1	---	---	0.2	---
Total Coliform Organisms	MPN/100 ml	---	---	2.2	23	---
Total Suspended Solids	mg/l	10 [2]	15 [2]	---	30 [2]	---
	lbs/day [3]	43	65	---	130	---
Turbidity [4, 7]	NTU	2 [8]	---	---	5	---

1 5-day, 20°C biochemical oxygen demand (BOD)
2 To be ascertained by a 24-hour flow proportional composite sample.
3 Based upon a design treatment capacity of 0.52 mgd (x mg/l x 8.345 x 0.52 mgd = y lbs/day).
4 The daily average turbidity shall not exceed 2 NTU. The turbidity shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period. At no time shall the turbidity exceed 10 NTU.

RWQCB Documented Non-compliance

The RWQCB has issued two notices of violation to DSPUD since 2002. Each notice addresses multiple violations of requirements in WDR-2002-088. The first notice of violation culminated in a formal order and penalties, while the second has up to present only required a written response from DSPUD.

Administrative Civil Liability Complaint R5-2007-0509 (April, 2 2007) found DSPUD with 76 violations based on their own monitoring and reporting of effluent from January 2000 to December 2006. The violations involve failure to meet required levels for pH, BOD, Total Coliform Organisms, and Total Suspended Solids. The RWQCB classified 36 of the violations as Serious, 32 as Non-serious, and 8 as Exempt from Mandatory Penalties. DSPUD was assessed a Mandatory Minimum Penalty of $204,000 based on 68 violations subject to Mandatory Penalties.

Administrative Civil Liability Order R5-2007-0528 (November 15, 2007) formalized the violations described in the Complaint and credited DSPUD $204,000 for costs "*having been spent by the Discharger to complete the compliance Project to prevent further effluent limit violations*". This type of waiver is provided to public-owned treatment plants serving small communities that meet "financial hardship" criteria (median annual income < 80% median annual income for California), and provide a compliance project that meets enforcement policy. The Order cites a letter from DSPUD dated April, 30 2007 "*in which it waived its right to a hearing before the Regional Water Board and requested that the Regional Water Board accept its compliance project. The project included a new activated sludge treatment system. The Discharger indicated that four million dollars had been spent on the project*".

The Notice of Violation (NOV) on August 8, 2008 followed the complaint of a resident downstream of the effluent discharge point and a field investigation by RWQCB staff on June 30. The NOV lists three separate violations: 1) algae growth below the effluent discharge point that appeared to be caused by the discharge; 2) algae growth in the facility's secondary clarifiers as an indication of operational problems; 3) monthly average nitrate levels for June that exceed the waste discharge limitation requirement.

The August 2008 NOV required a response from DSPUD to the following issues:

1. The inability of the WWTP to denitrify and to remove nitrate from the discharge. "*The WTTP cannot consistently meet its effluent limitation for nitrate … Please provide plans and a time schedule for reducing nitrate concentrations in effluent to comply with effluent limitations and to prevent further violations of receiving water limitations*".
2. The condition of the clarifiers and filter operations. "*Please provide a detailed explanation of the problems, and the measures being taken to improve operations at the facility*".

DSPUD responded in the form of a report (September 4, 2008) by their consultant Eco:Logic. In summary, the September 4, 2008 Report acknowledged the inability of the WWTP to meet effluent limitations for nitrates, yet claimed no connection of this problem with the biostimulation or algal blooms in the river.

> "*The flow and strength of wastewater is too variable to maintain a robust biological treatment process that can consistently nitrify and denitrify to the standards contained in Order R5-2002-0088…Very low wastewater temperatures also contribute to inhibiting the biological treatment process from performing in a robust manner.*"
>
> "*The nitrate limitation has no connection to biostimulation within the South Yuba River …Once discharge is reinitiated [in autumn] they will monitor the receiving water to prevent a reoccurrence of biostimulation within the South Yuba River.*"

The report asserts the expectation of credits for dilution by the South Yuba River that would allow a substantial increase of the nitrate limitations. In response to the second issue of the NOV, the report states that the facility is not experiencing operational difficulties with either the clarifiers or filters and claims as evidence that "*effluent turbidity is, and has been, within regulated parameters.*" The report states that no facility or operational improvements are planned at this time.

Additional Data-supported Violations

RWQCB staff provided SYRCL with DSPUD monitoring data contained in an Excel file. The electronic data began with records of effluent and monitoring data on June 1, 2002 and ended on July 31, 2007. The electronic file also included results of five California Toxics Rule (CTR) testing occasions noted in Table 2 Heretofore in this section, this period and these data are called the Electronic Dataset. In subsequent sections, more recent data is cited from hardcopy monitoring reports for which data apparently have not been transferred into database or spreadsheet.

Table 2: Summary of the Electronic Dataset: Periods of effluent discharge, CTR testing dates and summary of volumes (million gallons).

Discharge Period		CTR	Total	Half-	Total Discharge	Average Discharge
Start	End	Testing	Days	weeks	(Mgal)	(Mgal/day)
6/1/2002*	7/5/2002	4/10/02	35	10	7.199	0.2057
11/7/2002	6/30/2003	Nov, 2003	212	61	56.514	0.2678
11/9/2003	7/23/2004	Feb, 2004	266	76	63.271	0.2379
11/1/2004	7/21/2005	Dec, 2005	263	75	73.317	0.2788
11/4/2005	7/5/2006	Dec, 2006	244	70	76.547	0.3137
12/1/2006	7/18/2007	NA	230	66	57.499	0.2500

Disclaimer: While the author is responsible for any errors in the analysis and summary of these data, SYRCL and the author are not responsible for any errors in the data provided either to the RWQCB from DSPUD or from the RWQCB and its consultants.

Chlorine

Chlorine is used at the WWTP as a disinfectant and is the principal means of controlling coliform bacteria levels in the effluent. WDR-R5-2002-088 recognizes the potential for discharge to cause toxic concentrations of chlorine, thus requires continuous monitoring of chlorine residual in the effluent, and sets a limit of 0.02 mg/l as a 1-Hour Average.

The data provided to the RWB includes one value for chlorine per day, and that is assumed to be the 24-Hour Average. A total of 62 daily values exceed the chlorine limit. The minimum of those daily values is 4.2 mg/l and a maximum value of 10 mg/l is recorded for 7 days. The unlikely repetition of the maximum value and the lack of significant figures on those recorded values indicate that 10 mg/l is the upper limit of the measuring device, and actual levels of chlorine in the discharged effluent may have been higher.

All 62 violations of the chlorine requirement (not including 2007-2008) occurred during two periods: May 1-31, 2003 and January 1-31, 2004. Chlorine levels on the four dates before and after these two periods are recorded as <0.02 mg/l or ND (non-detect). I could find no explanation for the strange coincidence with calendar months, but this may exist within the narrative of monthly monitoring reports.

For the 62 days (of period 6/1/02 – 7/31-07) when the WWTP failed to meet their chlorine requirement, an average of 16.7 lbs/day of chlorine residual was discharged to the South

Yuba River. A total of 544 lbs of chlorine were discharged to the river in May 2003 and another 486 lbs in January 2004.

Coliform Organisms

Coliform bacteria pose a health risk to humans when present in contact waters. In their WDR-2002, the RWQCB recognizes that the South Yuba River downstream of the discharge includes public contact and non-contact recreation and defers to the California Department of Health Services (DHS) standard that effluent be disinfected such that the median MPN (most probable number) of coliform organisms does not exceed 2.2/100 ml, as a 7-day median. WDR-2002 also requires that the daily maximum of coliform organisms does not exceed 23 MPN/100ml. However, monitoring of effluent is required only twice weekly. In addition the WDR states"

> *"The method of treatment is not prescribed by this Order, but, must meet the DHS recommended level of treatment or equivalent when flows in South Yuba River provide less than a twenty-to-one (receiving stream to effluent) dilution. A turbidity effluent limitation has been included to assure compliance with the DHS recommended level of treatment. The DHS recommends treatment levels based on criteria to protect human health."* (13)

DSPUD measured coliform on 358 days during the period of record, and the requirement of 2.2/100ml was exceeded on 14 or 4% of those days. Of those 14 days in violation, the median value was 21 MPN/100 ml and the maximum was recorded on 3/2/2006 as ">1600". All but three of the days occurred subsequent to 2006 and documented violations. Five of the 14 days occurred in the months of June or July when contact water recreation in the South Yuba is of higher likelihood than other months.

pH

WDR-2002 requires pH monitoring once daily by grab samples, and requires that "*the discharge shall not have a pH less than 6.5 nor greater than 8.5*". A single pH value was found in the record of data for each day of discharge. Only one violation of the required limit was found: A pH of 5.0 on July 5, 2006. A pH of 6.5 was recorded on 13 occasions from November 5, 2005 to June 8, 2006. The average pH for all discharge days was 7.1.

Total Suspended Solids

WDR-2002 requires that Total Suspended Solids (TSS) be measured twice weekly using a method of 24-hour composite samples. In addition to the limits presented in Table 1,

> *"effluent samples collected over a monthly period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal)."*

On June 14, 2006 a TSS level of 159 mg/l and 269 lbs/day was a violation of the daily limit (30 mg/l; 130 lbs/day) and high enough to cause the weekly average limits for TSS to be exceeded for six days following. One violation of the 85% removal requirement was found for TSS: reduction of 77.7% on average for the month of May 2007.

Turbidity

Effluent Turbidity exceeded 10 NTU on 167 days in the period of record. The highest daily NTU was 114 on 12/31/2005 and coincided with a peak daily discharge of 0.922 Mgal. The impact of this particular event on receiving water was not monitored. The second highest daily turbidity was 22 NTU and the mean of the 167 violation days was 8.4 NTU.

Receiving water was measured on 34 of the 167 violation days, and surprisingly, the average change in turbidity from R-1 to R-2 was -0.1 NTU. These monitoring data warrant an explanation for how turbidity could decrease between monitoring stations when high turbidity effluent (relative to the South Yuba River) enters within the short section between.

Receiving water was measured 340 days out of 1250 days of discharge in the period of record. WDR-2002 requires that effluent discharge does not increase turbidity of receiving water more than 1 NTU when the R-1 has turbidities less than 5. This receiving water requirement was exceeded on five occasions 11/27/2002, 7/22/2004, 6/14/2005, 7/14/2005, 2/15/2007, and the range of change in turbidity was 1.1– 2.1.

Survival/Bioassays

Bioassays were conducted on 10 occasions in the period of record. The results of the Feb 2, 2004 test show 0% survival for minnow larvae, daphnia and algae. The data indicate that dechlorination was not functional at the time of the bioassay. However, this test was 2 days past the end of the month-long chlorine pollution described above and a "ND" was recorded for chlorine residual on Feb 2, 2004. In any case, the 0% survival is a violation of the WDR and an indication of occasionally severe impacts to aquatic life in the South Yuba River at the point of discharge.

Nitrate Violations since April 2007

WDR-2002 requires only weekly grab samples to monitor nitrate levels in effluent. The required limit is for the monthly average to not exceed 10 mg/l. The overall mean of 196 grab samples for nitrate in the electronic dataset is 10.12 mg/l. The last 15 of those samples occurred after the expiration of the 5-yr period to comply with nitrate requirements (April 1, 2007), and the average of those nitrate levels is 10.72 mg/l. June and July 2007 were in violation of the monthly nitrate requirement with monthly averages of 17.4 and 20.8 mg/l, respectively.

Although I did not have data from monthly monitoring subsequent to July 2007, two sources indicate that DSPUD exceeded nitrate limitations for two months of the last year. DSPUD Notes from 5-20-08 (Appendix) indicate that the received notice of violations for nitrate in effluent for November and December, 2007. Secondly, the RWQCB staff member who prepared the August 8, 2008 Notice of Violation tabulated and reviewed the effluent nitrate levels reported in DSPUD monthly reports and noted a violation of the monthly average limit for nitrate in June 2008. No mention was made of nitrate levels for earlier months in 2008.

Other Possible Violations of Waste Discharge Requirements

Discharge When Land Disposal Possible

The first effluent limitation described in WDR-2002 requires that discharge occur "only when weather or snow conditions preclude land disposal". The months of October through July are listed as months when discharge to the river can occur, but the clear intent of WDR-2002 is to minimize discharge compared to land disposal through irrigation of Soda Springs Ski Area in dry months. Because land disposal is more costly than discharge to the river, DSPUD lacks incentive to follow the intent of this requirement. Unfortunately, WDR-2002 provides no objective monitoring criteria for determining when discharge to the river must not occur within the period of October through July.

Over the last seven years, discharge to the South Yuba River has ceased as early as June 30 and as late as July 23. While it would be expected that these end dates would correspond with hydrologic conditions, this is either not the case based on data in Table 4, or hydrologic conditions on the slopes of Soda Springs Ski Area are unique to the area. Table 4 lists the adjusted May snowpack for the Donner Summit snow survey (elev. 6900') and the last day of discharge. The May survey is the last survey of the year, and adjusted by water content is a good predictor of streamflow and soil moisture into the summer season. Remarkably, July 18, 2007 was one of the latest calendar dates that discharge was ended and occurred during an exceptionally dry year.

Table 3. Adjusted May Snowpack at the Donner Summit Snow Survey (6900') and last date of effluent discharge to the South Yuba River.

Year	Adjusted May Snowpack (inches)	Last Discharge Day
2002	20.6	5-Jul
2003	27.8	30-Jun
2004	13.2	23-Jul
2005	35.4	21-Jul
2006	47.7	5-Jul
2007	7.6	18-Jul
2008	14	2-Jul

Risk of Spill Events due to Limitations of Storage

DSPUD has a maximum of 1.5 million gallons of reserve storage. WDR-2002 requires that sufficient storage be available to prevent spills in the event of operational shut-downs. Considering that discharge of more than 0.50 Mgal/day occurs during the winter holiday period when intense storms are not uncommon, it seems reasonable to conclude that DSPUD has no more than 3 days of emergency storage and a moderate to high-risk of spill events due insufficient storage.

Compliance with the California Toxics Rule

The California Toxics Rule requires dischargers to test for a long list of toxic substances and -- if present at potentially harmful or degrading levels -- to issue certain reports and evaluations. Five CTR tests were conducted on DSPUD effluent in November 2003 and December of 2004, 2005, and 2006. Table 4 lists the substances for which maximum levels in those tests surpassed receiving water levels and may pose a concern for human health or aquatic life.

WDR-2002 requires that if CTR tests reveal toxics present, then a Technical Study Report must be completed, as well as a Toxics Identification Evaluation. Without a complete record of files, I am unable to determine if DSPUD has fully complied with WDR-2002 in response to the results of CTR tests.

Undetected Violations due to Insufficient Monitoring

The monitoring data available from DSPUD is not sufficient to thoroughly evaluate the magnitude and frequency with which some pollutants exceed limitations. For example, DSPUD is required to monitor nitrates and ammonia only once weekly. Notes from DSPUD's Expansion Committee Meeting on May 20, 2008 (Appendix) mention that the plant met ammonia limits based on required monitoring, yet "Plant staff have performed daily effluent ammonia tests which indicate that the plant frequently exceeds its effluent limits."

Several other pollutants seem to have insufficient monitoring requirements for assessing impacts to the South Yuba River. The limit for Total Coliform Organisms is based on 7-day median and Daily maximum values, but necessary tests are required only twice per week. Priority pollutants, including toxic metals and recognized carcinogens are tested only annually.

Limited monitoring requirements for receiving water has provided limited means to assess direct impacts of waste discharge on the South Yuba River. The monitoring requirements for receiving water specify that only five parameters (dissolved oxygen, pH, turbidity, temperature and conductivity) be measured twice weekly. As described in the section on turbidity above, some of the receiving water data may warrant scrutiny. WDR-2002 requires that notes on receiving water conditions are to be taken with regard to floating or suspended matter, discoloration, visible films/sheens, slimes, objectionable growths, and nuisance conditions. This type of monitoring somewhat subjective and may be less useful for detecting impairment of receiving waters than intended.

Table 4: Analytes from CTR testing results that have maximum values in excess of receiving water levels (MDL = method detection limit).

Analyte	Units	Maximum	RecWater	MDL
Arsenic	ug/l	0.6	0.2	0.1
Chromium	ug/l	1.4	0	0.1
Chromium, Hexavalent	ug/l	20	0	2
Copper	ug/l	7.8	0.6	0.1
Lead	ug/l	0.3	0.2	0.1
Mercury	ug/l	0.00407	0.00393	0.0002
Nickel	ug/l	2.4	0.2	0.2
Silver	ug/l	0.26	0	0.1
Zinc	ug/l	30.8	6.1	0.4
Cyanide-Total	ug/l	33	2	2
Chloroform	ug/l	15.1	0	0.3
Dichlorobromomethane*	ug/l	1.2	0	0.1
Toluene	ug/l	0.6	0	0.2
1,4-Dichlorobenzene	ug/l	0.6	0	0.1
Diethyl phthalate	ug/l	0.3	0	1
Aldrin	ug/l	0.005	0	0.002
alpha-BHC	ug/l	0.044	0	0.005
4,4'-DDT	ug/l	0.006	0	0.005
1,4-Dichlorobenzene	ug/l	0.5	0	0
Hardness	mg/l	23	22	1
Chloride	mg/l	58.2	30.7	0.08
Fluoride	mg/l	0.07	0	0.04
Nitrate as N	mg/l	48.6	0	0.05
Nitrite as N	mg/l	0.35	0	0.01
Sulfate as SO4	mg/l	71.1	1.07	0.08
Sulfite	mg/l	8	0	2
Specific Conductance	umhos/cm	807	137	2
Total Dissolved Solids	mg/l	926	117	2
Ammonia as N	mg/l	18.9	0.13	0.02
Total Phosphorus as P	mg/l	1.88	0	0.02
MBAS	mg/l	0.28	0.02	0.02
Dibutyltin	ug/l	0.15	0	0.01
Monobutyltin	ug/l	0.356	0	0.002

*The RWQCB's Discharger Permit Summary indicates that dichlorobromomethane (a recognized carcinogen) has been detected in DSPUD effluent at levels as high as 8.2 ug/l, but I am unaware of the source of that data.

Reporting Requirements

According to WDR-2002, DSPUD was to submit a report on waste discharge (ROWD) no later than December 1, 2006. DSPUD submitted the ROWD in April 2007. This deviation from required reporting schedule calls to question other reporting requirements for which I can not confirm compliance for lack of a complete record. SYRCL requests that RWQCB confirm the following reporting requirements of WDR-2002 have been met:

1. Interagency Agreement due November 1, 2002
2. CTR Study Report due March 1, 2003
3. CTR Study Report on dioxins due March 1, 2004
4. Progress report on compliance of nutrient and ammonia requirements due January 1 and July 1 of each year (2002-2007).
5. Full compliance report for WDR-2002-0089 due April 1, 2007.

DSPUD submitted a compliance project to the RWQCB in April 2007 for credit toward 68 mandatory minimum penalties associated with 68 waste discharge violations from 2000-2006. Considering that the compliance project appears to not have eliminated all relevant types of violations, SYRCL requests clarification on what qualifies as a compliance project and what accountability exists for compliance projects that fail to meet their intended purpose.

Other Comments on the Discharger Permit Summary: Plant Performance, Denial, and Distorted Dilution

SYRCL encourages the RWQCB to seriously consider the complete record of non-compliance by DSPUD, as well as all statutes written to protect the quality of water in the South Yuba River when preparing a draft permit for discharge. The last permit, WDR-2002 stated:

> *"This Order provides for an increase in the volume and mass of pollutants discharged. The increase will not have significant impacts on aquatic life, which is the beneficial use most likely affected by the pollutants discharged (BOD, suspended solids, chlorine residual, temperature, and metals). The increase will not cause a violation of water quality objectives."* (17)

Now, DSPUD seeks a new permit that would allow for further increases in discharge volumes even though the record shows that they have not met required limits for a variety of pollutants discharged, and impacts to aquatic life have certainly occurred. The record of non-compliance and documents by DSPUD indicate that the plant manager is willing to falsely characterize the performance of their WWTP in an attempt to influence public opinion and regulators. The stated agenda of DSPUD is expansion of wastewater discharge without the operational improvements necessary to protect water quality conditions in the South Yuba River.

DSPUD's website states "The treatment plant is meeting its waste discharge quality requirements, based on daily, weekly and monthly averages." Notes from DSPUD's Expansion Committee meeting on 5-20-2008 (Appendix) reveal that the builders of the plant have estimated peak flow capacity to be less than what they are currently permitted to operate at:

> "Brentwood Industries estimated the plant could have a capacity to meet a peak flow of 0.44 MGD. This capacity estimate was based on the favorable ammonia concentration data from the licensed labs. A lower capacity would be estimated based on the results of the in-house lab results."

DSPUD's response to the August 2008 notice of violation claimed that there is no connection between nitrate levels in their effluent and biostimulation (algal blooms) despite both the RWQCB notice of violation and their own consultant's field investigation acknowledging that nutrients in the effluent was, at least in part, a cause for biostimulation. The claim that such an event is unprecedented and unlikely to occur again further suggests that DSPUD is willing to deny actual impacts caused by their discharge. The evidence that a biostimulation event has never occurred previously is anecdotal and weak. If granted, DSPUD's requested increase in permitted nitrate loads for effluent discharge would certainly increase the likelihood of repeat biostimulation events. In at least one more example of denial, the report provides claims that turbidity levels have met required limits.

While the pattern of denial exhibited by DSPUD is troubling, none of their distortions is more threatening than the claim that the South Yuba River provides greater than 20:1 dilution for their effluent discharge.

The South Yuba River Frequently Provides Less than 20:1 Dilution for Discharge of Effluent

The Discharger Permit Summary recently issued to DSPUD by the RWQCB assumes that dilution will be granted to assist in compliance for nitrates and dibromochloromethane. If granted, the "dilution credits" would allow DSPUD to increase the volume and rates of discharge to the South Yuba River without lowering nitrate levels at all. The combination could result in a significant net increase in the total amount of nitrates discharged to the South Yuba River.

In their ROWD, DSPUD provided misleading evidence that the South Yuba River had sufficient flows to substantiate dilution factors for their effluent of greater than 20 to 1. In this refutation, I use the same hydrological dataset available from the USGS (Table 5), as well as hydrologic data available from PG&E that was not referenced by DSPUD. Both datasets originate at the Cisco Grove gage that was operated by the US Geological Survey from 1993 until 1994, and by PG&E from 1994 to 2004. The gage is located at an elevation of 5500 feet and approximately 10 miles downstream from the discharge location. Unfortunately, no stream gage or hydrologic record exists for the South Yuba River at the discharge point or within the discharge watershed.

DSPUD has assumed that flows in the South Yuba at the discharge point can be reasonably approximated using the proportion of watershed area (0.4054). They do not mention any of the factors which could, by this method, underestimate flows at the point of discharge for certain months of the discharge season:

1. Disproportionate contribution by accretion – Precipitation and snowmelt that infiltrates can be transported through subsurface strata and groundwater to lower channel locations.
2. Isohyetal differences --- The watershed of the discharge location has higher mean elevation than the watershed of the gage; a higher proportion of precipitation as snowfall means lower flows during winter than estimated.

3. Cascade Lake and Kidd Lake are portions of the Cisco Grove watershed subject to hydrologic alteration by PG&E impoundments and releases.
4. Disproportionate consumptive use of water -- The majority of population in the Cisco Grove watershed area is located within the discharge watershed area, potentially lowering relative flows of the discharge area.

Each of the above factors should be investigated if Cisco Grove gage data is to continue to be utilized for estimating flows at the point of discharge. Uncertainty with these factors notwithstanding, the proportional watershed method as presented in the ROWD can be checked against reality. The South Yuba River at the point of discharge is an ephemeral stream and many witnesses can attest to a commonly dry stream channel in late summer and fall. Note that Table 5 falsely suggests minimum monthly average flows of greater than 1 cfs during these months.

Regardless of the errors in the method provided by DSPUD's for estimating flow at the point of discharge, their claim of 20:1 dilution factor can be easily dismissed by conducting a more thorough analysis of hydrologic data for the Cisco Grove gage. DSPUD uses overall averages of river flow and discharge to estimate a single dilution factor, yet average and minimum monthly flow, as presented in Table 5, both vary between months of the discharge season (Oct-July) by more than one order of magnitude. Due to the extreme range of river flows that may be seen within any month from November through June, dilution potential must be evaluated by a monthly or more frequent occurrence.

Table 6 presents dilution factors for each month of the current discharge season using the currently permitted design capacity for the WWTP (0.52 Mgal/d). This discharge is nearly equivalent to DSPUD's estimate (0.51 Mgal/d) for average discharge after proposed expansion. For gross monthly averages, dilution factors exceed 20:1 for all discharge months except October. For minimum monthly average flows, dilution factors exceed 20:1 only during April and May. **For half the discharge months, the dilution factor is 2.3 or less.** It is important to keep in mind that minimum monthly average flows are greater than absolute minimum flows for a given month. In other words, actual daily dilution factors for each month would include some values even less than what is presented in Table 6 under minimum average flow.

An analysis dilution for weekly periods would provide a more thorough evaluation of dilution factors. For example, the 7-day average daily discharge for December 22-31, 2005 was 0.61 Mgal/d. To achieve 20:1 dilution during for demonstrated week such as that, the South Yuba River would have to be flowing 19 CFS or greater. If cold weather kept the discharge watershed (6800-9300' in elevation) frozen, then it is likely that flows would be closer to the minimum average for December and January (1.1 cfs = 0.71 Mgal/day). The dilution factor would be 1.16 (0.71Mgal/0.61Mgal), and **46% of the South Yuba River would be effluent.**

Table 5: This table of estimated flows in the South Yuba River comes from DSPUD's Report of Waste Discharge (April 2007)

Estimated South Yuba Flows at DSPUD Discharge Point (a)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Monthly Average Flow, cfs	15	37	50	49	54	78	173	291	162	32	10	10
Min. Monthly Flow, cfs	1.09	0.85	1.00	1.16	3.60	9.28	37.3	72.2	4.14	1.87	1.72	1.74
Max. Monthly Flow, cfs	169	339	410	292	347	272	324	544	551	268	37	23

(a) Based on multiplying South Yuba River flows at Cisco (USGS 11414000) by 0.4054 which is the ratio of the DSPUD watershed area (21.0 square miles) by the Cisco watershed area (51.8 square miles). The flow record is from water year 1943 to 1994.

Table 6: Monthly dilution factors for discharge by the DSPUD of 0.52 Mgal/d into the South Yuba River based on estimated monthly average flows (Table 5). Estimated percent of effluent in receiving water shown for minimum monthly average flow.

	Mean Avg Flow		Minimum Avg Flow		
Month	CFS	Dilution	CFS	Dilution	% Effluent
Oct	15.2	18.8	1.1	1.3	42.6%
Nov	36.9	45.8	0.9	1.1	48.6%
Dec	49.9	61.9	1.0	1.2	44.6%
Jan	49.1	60.9	1.2	1.4	40.9%
Feb	54.3	67.5	3.6	4.5	18.3%
Mar	77.8	96.7	9.3	11.5	8.0%
Apr	172.7	214.5	37.3	46.4	2.1%
May	291.5	362.1	72.2	89.6	1.1%
Jun	161.8	200.9	4.1	5.1	16.3%
Jul	31.8	39.5	1.9	2.3	30.1%

To achieve a 20:1 dilution of 0.52 Mgal/d, the South Yuba River must be flowing 13 cfs or greater at the discharge location. A complete analysis of dilution potential would use the entire hydrologic record to calculate daily probabilities of flow exceeding 13 cfs. In lieu of that necessary flow frequency analysis, I have provided a graph for conducting a visual analysis of this type for one year. Using the flows at Cisco Grove (and ignoring the issues associated with using this distant and much lower site) we can evaluate potential dilution by expanding the 13 cfs using the watershed ratio (0.4054). Figure 1 plots daily flow for the one annual period of potential discharge against the 20:1 dilution threshold (at Cisco Grove) of 32 cfs (13cfs*1/0.4054). The chosen year, WY 2001, is a relatively dry one. The threshold for dilution is met for only five days in fall, eight days in February and the spring snowmelt period of March 7 to June 7.

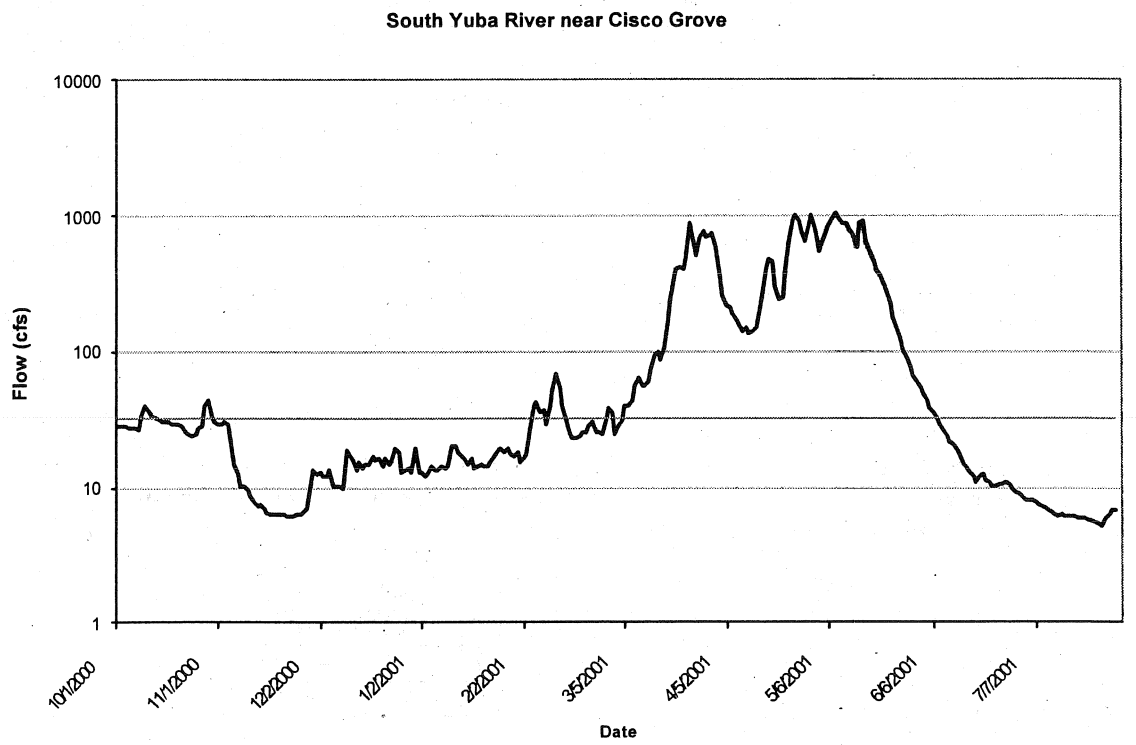

Figure 1: Hydrograph for the South Yuba River at Cisco Grove for 1 Oct 2000- 31 July 2001 with a reference line for 32 cfs representing estimated 20:1 dilution at DSPUD discharge location. Flow data from PG&E. See text for description of errors contributing to overestimation of dilution by this method.

The Donner Summit WWTP cites highly variable rates of inflow as a primary reason for problems in meeting waste discharge requirements. In addition to the winter holiday in December, large discharges can occur during weekends or holidays in November, January, and February -- months with very low (<1.5 cfs) minimum monthly flow. As indicated by Figure 1, June is also a month with high risk of very little dilution. For the years 2005 and 2006 the monthly average discharge in June was 0.303 Mgal/d and 0.278 Mgal/d, respectively. These discharges are greater than the overall average discharge, and likely associated with actual dilution factors as low as 2:1.

The variability in available dilution for DSPUD discharge, as well as the problems with using the Cisco Grove 10 miles downstream, necessitates a stream gage at the discharge location. Without actual, real-time stream flow data for DSPUD, discharges into the South Yuba River involve high risk of excessive impacts to beneficial uses and the quality of receiving water. Similarly, there must be an adaptive mechanism for changes in available water for dilution. The prevailing model of climate change effects to Sierra spring-snowpack warn of

significant reduction in streamflow during spring and summer months[1]. These changes in available water for dilution could occur within the term of DSPUD's next permit for waste discharge.

Summary Conclusions

1. Previous notices by the RWQCB of violations by DSPUD have been incomplete in addressing all incidences of failure to meet waste discharge requirements. In some cases -- such as chlorine, turbidity and survival -- the omissions may reflect serious failure in plant operations to protect aquatic life in receiving waters.

2. While DSPUD has paid no penalties for violations, the compliance project accepted by the RWQCB has not been effective in preventing effluent from exceeding required limitations for pollutants of the type (Coliform and TSS) for which the discharger was assessed Mandatory Minimum Penalties.

3. Since the expiration of WDR-55-2002-089 in April 1, 2007, DSPUD has been in frequent violation of nitrate (and potentially ammonia) requirements despite a five-year period in which to come into compliance before this date.

4. DSPUD has denied responsibility for the biostimulation in the South Yuba River and misrepresented its record of compliance with waste discharge requirements in official reports to the RWQCB as well as in its public communications.

5. The South Yuba River frequently provides less than 20:1 dilution for effluent discharge between October and July despite DSPUD's misleading claims to the contrary.

6. Any future analysis of dilution factors must focus on the question of how often the South Yuba River provides 20:1 dilution. The analysis should calculate the frequency probability of 20:1 dilution for each calendar day utilizing the entire hydrologic record including data from PG&E.

7. The installation and maintenance of a stream gage at the discharge location is essential to accurate monitoring of discharge effects, and responsible use of dilution to minimize or mitigate potential impacts to the South Yuba River.

Appendix:
DSPUD Wastewater Expansion Committee Meeting Notes 5-20-08 [DSPUD-5-20-08.pdf]

[1] Elevation Dependence of Projected Hydrologic Changes in the San Francisco Estuary and Watershed, K. Knowles and D. Cayan, 2004.